



-- PATENT APPLICATION --  
 -- Attorney Docket No. 25835.11 --

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: M.L. Collins et al. )  
 )  
 Serial No.: 08/238,080 )  
 )  
 Filing Date: May 3, 1994 )  
 )  
 Title: TARGET AND BACKGROUND CAPTURE )  
 METHODS WITH AMPLIFICATION FOR )  
 AFFINITY ASSAYS )  
 )  
 Art Unit: 1807 )  
 )  
 Examiner: Dianne Rees, Ph.D. )  
 )

#21

#### TERMINAL DISCLAIMER

The Assistant Commissioner for Patents  
 Washington, D.C. 20231

Dear Sir:

Petitioner, AMOCO CORPORATION, a corporation of the State of Indiana with post office address P.O. Box 87703, Chicago, Illinois 60680-0703, certifies that it is the assignee of the entire right, title and interest in U.S. Patent Application Serial No. 08/238,080 filed May 3, 1994 for Target And Background Capture Methods With Amplification For Affinity Assays and that said Assignment is recorded for its predecessor application U.S. Serial No. 07/136,920 at Reel 4834, Frame 0373. Petitioner AMOCO CORPORATION hereby disclaims the terminal part of any patent granted on Application Serial No. 08/238,080 which would extend beyond the date of the end of the full statutory term available to any patent issuing from co-pending U.S. Serial No. 08/236,877 for Target And Background Capture Methods And Apparatus For Affinity Assays.

Petitioner does not disclaim any terminal part of any patent granted on Application Serial No. 08/238,080 prior to the expiration date of the full statutory term of any patent issuing from

-- PATENT APPLICATION --  
-- Attorney Docket No. 25835.11 --

co-pending U.S. Serial No. 08/236,877 in the event that such patent later expires for failure to pay a maintenance fee, is held unenforceable or found invalid, is statutorily disclaimed in whole or terminally disclaimed under 37 C.F.R. §1.321(a), has all claims cancelled by a re-examination certificate, or is otherwise terminated prior to the expiration of its full statutory term.

AMOCO CORPORATION hereby agrees that any patent granted on Application Serial No. 08/238,080 shall be enforceable only for and during such time period that the legal title to such patent and any patent issuing from U.S. Serial No. 08/236,877 shall be the same, this agreement to run with any patent granted on the above-identified patent application and to be binding upon the grantee, its successors or assigns.

The undersigned certifies that all of the documents in the chain of title of Application Serial No. 08/238,080 and U.S. Serial No. 08/236,877 have been reviewed and, to the best of the undersigned's knowledge and belief, title to both is in AMOCO CORPORATION.

The undersigned certifies that the authority to sign this TERMINAL DISCLAIMER has been delegated to him by AMOCO CORPORATION.

Date: July 10, 1997  
AMOCO CORPORATION  
Law Department  
200 East Randolph Drive  
Chicago, Illinois 60601  
Phone: (312) 856-2052  
Facsimile: (312) 856-4972

A:\TRMOSCL.WPD

Respectfully submitted,

By: Frank J. Sroka  
Frank J. Sroka  
General Attorney  
Amoco Corporation  
Registration No. 27,597



RECEIVED

SEP 10 1997

PATENT APPLICATION --  
Attorney Docket No. 25,835.11 --  
GROUP 1000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: M. L. Collins, et al.

Serial No.: 08/238,080

Filing Date: May 3, 1994

Title: TARGET AND BACKGROUND CAPTURE  
METHODS WITH AMPLIFICATION FOR  
AFFINITY ASSAYS

Art Unit: 1807

Examiner: Dianne Rees, Ph.D.

CERTIFICATE OF MAILING & FACSIMILE RESPONSE

I hereby certify that this correspondence is being sent via facsimile to: Dianne Rees, at facsimile number (703) 305-7401, and is being deposited with the United States Postal Service as first class mail, postage prepaid, in an envelope addressed to: The Commissioner of Patents and Trademarks, Washington, D.C. 20231, on the date shown below.

LESLIE B. HENSON

(Printed Name)

Leslie B. Henson

(Signature)

August 15, 1997

(Date of Deposit)

RETRANSMITTAL AFTER FINAL OF  
TERMINAL DISCLAIMER AND EXECUTED  
DECLARATION OF DAVID H. PERSING, M.D., PH.D.

The Assistant Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

During an interview dated July 10, 1997, Applicants were informed that the pending claims would be allowed pending receipt of an executed Declaration of Dr. Persing and a terminal disclaimer. Thereafter, Applicants submitted the executed Declaration and terminal disclaimer by facsimile on July 11, 1997. (The facsimile was sent to the Assistant Commissioner of Patents at (703) 305-3014. Applicants' facsimile machine indicated that the intended transmission was successful. Applicants have retained a copy of the confirmation report from the facsimile machine. A copy of the confirmation report is included with this paper.)

09/25/1997 CSTRENT 0000029 DAB:220530 00238080  
01 FC:148 110.00 CH

Applicants' representative contacted the Examiner on August 15, 1997 to inquire as to the status of the application and was informed that the Declaration had not yet been received. Applicants' representative and the Examiner agreed that Applicant would retransmit the papers to the Examiner directly. Accordingly, Applicants transmit herewith copies of the executed Declaration of Dr. Persing and the executed terminal disclaimer.

Applicants note further that their previous submission did not include the fee required under 37 CFR 1.20(d) for filing the terminal disclaimer and did not provide authorization to access a deposit account to satisfy the fee requirement. Accordingly, Applicants herewith authorizes the Assistant Commissioner to charge this fee and any additional fees which may be required for this application under 37 CFR §1.20, or credit any overpayment, to Deposit Account No. 22-0590. An extra copy of this paper is enclosed for the convenience of the Finance Branch.

Applicants wish to express their appreciation to the Examiner for the consideration extended to Applicants' representative and the Examiner's helpfulness in advancing the application.

Finally, Applicants submit that all claims are in condition for allowance, which action is earnestly solicited.

Date: 8/15/97  
AMOCO CORPORATION  
Law Department  
3100 Woodcreek Drive  
Downers Grove, Illinois 60515-5400  
Phone: (630) 271-7417  
Facsimile: (630) 271-7054

Respectfully submitted,  
AMOCO CORPORATION

By: Norval B. Galloway  
Norval B. Galloway  
Attorney for Applicant  
Registration No. 33,595



**EXHIBIT 1:**  
**CURRICULUM VITAE**  
**DAVID H. PERSING, M.D., PH.D.**

11/11/97 08:02:30

**CURRICULUM VITAE**  
**DAVID H. PERSING, M.D., PH.D.**

**David Harold Persing, M.D., Ph.D.**

**Date of Birth:** June 13, 1955, San Jose, California

**Address:** 2225 48th Street, S.W., Rochester, MN 55902

**Telephone:** (507) 284-2876 (Work)  
(507) 280-7696 (Home)  
E-mail: persing@mayo.edu

**Marital Status:** Married

**Education:**

September 1974 - June 1979  
California State University, San Jose, California  
B.A. in Biochemistry awarded June 1979

October 1980 - May 1988  
School of Medicine, University of California, San Francisco

October 1981 - May 1988  
Medical Scientist Training Program,  
University of California, San Francisco

September 1982 - March 1987  
Graduate Program in Biochemistry and Biophysics,  
Division of Genetics, University of California,  
San Francisco

March 1988  
Ph.D. granted, Department of Biochemistry and  
Biophysics, University of California, San Francisco

May 1988  
M.D. granted, School of Medicine, University of California, San Francisco

July 1988 - June 1990  
Resident and Fellow, Department of Laboratory Medicine, Yale School of Medicine

July 1989 - September 1990  
Research Fellow, Department of Cell Biology, Yale School of Medicine

467053 0702280

**Honors:**

Graduation with highest honors,  
California State University, San Jose, California, 1979

Departmental Honors in Chemistry, 1979

Finalist, Dean's Prize for Research, School of Medicine, 1981

Graduate Dean's prize for Student Research,  
University of California, San Francisco, 1984

Gip A. Hudson Award for the study of liver diseases,  
National Student Research Forum, Galveston, Texas, 1985

James McLaughlin Award for the study of infectious diseases,  
National Student Research Forum, Galveston, Texas, 1985

University Patent Funds Award, 1986

Young Investigator Award,  
Academy of Clinical Laboratory Physicians and Scientists, 1989

Mayo Foundation Scholar, 1990

U. S. Patent Application: "Sensitive and Specific Detection of *B. burgdorferi* by Nucleic Acid Amplification," 1994

U. S. Patent Application: "Specific Detection of Rifampin Resistant *Mycobacterium tuberculosis* by Nucleic Acid Amplification," 1994

U.S. Patent Application: "Method for Detecting *Borrelia burgdorferi* Infection," 1996

College of American Pathologists, Microbiology Resource Committee, 1993-present

ASM Foundation Lectureship, 1995-1997

Associate Editor: *Journal of Clinical Microbiology*, 1996-

Associate Editor: *Molecular Diagnosis*, 1996-

1997 Justus Strom Award , Swedish Medical Society

**Dubious Honors:**

Consultant to Criminal Attorney Barry Scheck and invited expert witness, O.J. Simpson criminal trial

**Editorial Boards:**

Journal of Clinical Microbiology (1990-1996)  
Diagnostic Microbiology and Infectious Diseases (1994-96)  
New England Journal of Medicine (Regular Reviewer)  
Gastroenterology (Regular Reviewer)  
Journal of Infectious Diseases (Guest Reviewer)

**Scientific Advisory Boards:**

Vysis, Inc., Naperville, IL (1995-present)  
Corixa, Inc., Seattle, WA (1995-present)  
BioMerieux, Marcy L'Etoile, France (1996-present)

**Licensure and Certification:**

Status: Medicine and Surgery License #35080, State of Minnesota  
Board Certified Forensic Examiner  
Board Eligible, Clinical Pathology

**Appointments:**

Summer Research Fellowship, University of California,  
San Francisco, School of Medicine, 1980

September 1981 to May 1988:  
Medical Scientist Training Program, University of California, San Francisco

July 1988 to June 1990:  
Resident, Department of Laboratory Medicine, Yale University School of Medicine

July 1990 to September 1990:  
Mayo Foundation Scholar, Department of Cell Biology, Yale University School of Medicine

September 1990 to June 1994:  
Senior Associate Consultant, Divisions of Clinical Microbiology, Experimental Pathology and  
Infectious Diseases, Mayo Clinic/Foundation

June 1994 to present:  
Consultant, Divisions of Clinical Microbiology, Experimental Pathology and Infectious Diseases,  
Mayo Clinic/Foundation

January 1991 to June 1995:  
Assistant Professor, Department of Laboratory Medicine and Pathology, Mayo Medical School

July 1995 to present:  
Associate Professor of Microbiology, Mayo Medical School, Mayo Clinic/Foundation

July 1995 to present:  
Associate Professor, Department of Laboratory Medicine and Pathology, Mayo Medical School



September 1991 to present:  
Adjunct Assistant Professor, Department of Biology/  
Microbiology, University of Wisconsin-La Crosse

1996 to present:  
M.D.- Ph.D. Program Council, Mayo Medical School

**Societies:**

American Association for the Advancement of Science  
California Medical Association  
American Society for Microbiology  
Minnesota Medical Association  
American Medical Association  
American Society for Tropical Medicine and Hygiene  
American College of Rheumatology

**Teaching Experience:**

Teaching Assistant, Chemistry for Engineers, San Jose State University,  
September 1979 to June 1980

Graduate Teaching Assistant, Introductory Biochemistry  
UC San Francisco, September 1982 to April 1983

Instructor, Biochemistry National Boards Review Course,  
School of Dentistry, UC San Francisco, 1983-1986

Biochemistry Advisor, Health Science Special Services  
Summer Program, 1984-1986

Laboratory Instructor, Medical Microbiology Course, Yale School of  
Medicine, 1988-1989

Lecturer, Medical Microbiology Course, Yale School of Medicine, 1989

Medical Microbiology Course, Mayo Medical School, 1991-present

**Volunteer Services:**

Department of Public Health, Huehuetenango, Guatemala,  
1977-1978

National Ski Patrol, Alpine Meadows and Homewood, CA, 1978-1981

Dorothy Day House, Rochester, MN, 1992-present

**Extracurricular Activities:**

Skiing, vintage automobile restoration, brass ensemble (trombone)

### Research Experience and Supervisors:

Spring 1979 - Summer 1980

Dr. Robert Fowler, Department of Biology, San Jose State University. Mutational specificity of the base analogue, 2-aminopurine in *Escherichia coli*.

Summer 1980 - Spring 1981

Dr. Phillip Coffino, Department of Microbiology, UC San Francisco. Mechanism of 2-aminopurine mutagenesis in mouse T-lymphosarcoma cells.

Summer 1981 - Fall 1981

Dr. Harold E. Varmus, Department of Microbiology, UC San Francisco. Molecular analysis of mutant src alleles.

Summer 1982 - Winter 1983

Dr. Patrick O'Farrell, Department of Biochemistry, UC San Francisco. Isolation and characterization of DNA clones representing the engrailed locus of *Drosophila melanogaster*.

Spring 1983 to 1988

Drs. Donald Ganem and Harold Varmus (1989 Nobel Laureate) (thesis co-advisors) Identification and characterization of the presurface proteins of hepatitis B virus.

July 1989 to September 1990

Dr. Ari Helenius, Department of Cell Biology, Yale School of Medicine.  
Papovaviruses: Assembly, Disassembly, and Cellular Interactions.

### Current Research Interests:

Laboratory-based, extramurally funded programs.

- 1) Immunological interactions of tick-borne infections
- 2) Determinants of microbial persistence and tissue tropism
- 3) Effects of T cell differentiation on disease expression
- 4) Identification of novel T cell adjuvants from microbial sources

Clinical research

- 1) Association of viral heterogeneity and host immunogenetic determinants in viral disease expression
- 2) Pathogen discovery by broad-range amplification techniques
- 3) Association of infections with cancer and chronic human diseases

Extramural Support:

NIH - Allergy and Infectious Diseases: 1-PO1-AI30548-01-A1 (9/1/91 - 8/31/96)

Lyme Disease: Pathogenesis and Protection (Yale Program Project Grant),

P.I.: S. W. Barthold, D.V.M., Ph.D. Co-investigator: David H. Persing, M.D., Ph.D.;  
\$295,407 award amount, direct costs

NIH - Allergy and Infectious Diseases: 1-R01-AI32403-01 (9/30/91 - 8/31/97)

Mechanisms of Biological Variation in Lyme Disease,

P.I.: D. H. Persing, M.D., Ph.D.; \$1,006,775 award amount, direct costs, Status: renewal pending

NIH - Arthritis Institute 1-R01-AR41497-01 (9/1/91 - 8/31/95)  
Molecular Diagnosis and Monitoring of Lyme Disease,  
P.I.: D. H. Persing, M.D., Ph.D.; Co-funded with 1-R01-AI32403-01; \$227,359 award amount,  
direct costs; Status: decided against renewal of AR portion

Centers for Disease Control - U50/CCU510343- (4/15/94 - 2/1/98)  
Genetic Diversity of *B. burgdorferi* in the United States;  
P.I.: D. H. Persing, M.D., Ph.D.; \$120,000 total costs per year

Centers for Disease Control - U50/CCU510528 (11/1/97 - 10/31/00)  
Recombinant Immunoassays for Detection of *Babesia microti* Infection;  
P.I.: David H. Persing, M.D., Ph.D.; \$62,500 per year, direct costs

NIH - Allergy and Infectious Disease: 1-R01-AI45253-01 (9/30/94-9/29/99) Animal Models for  
Chronic Lyme Disease;  
P.I.: Stephen W. Barthold, D.V.M., Ph.D.; Co-investigator: David H. Persing, M.D., Ph.D.;  
Co-investigator portion: \$683,114 total award amount, direct costs

Chiron Corporation - Molecular Diagnostic Assay Development Award (12/1/92-present);  
Co-investigator: David H. Persing, M.D., Ph.D.; Coinvestigator portion: \$104,000 per year, direct  
costs

Corixa Corporation - 4-1-96 to present (indefinite termination) Identification of Microbial  
Biomolecules with Novel Immunologic Properties;  
P.I.: David H. Persing, M.D., Ph.D.; \$50,000 per year, direct costs

NIH - Allergy and Infectious Disease 1-R01-AI41103-0; Investigation of the Natural History of  
*Babesiosis* (5/1/97 - 5/31/00); \$124,914 per year, direct costs

45E050" 030E220



EXHIBIT 2:  
PUBLICATIONS  
DAVID H. PERSING, M.D., PH.D.

16E0571 0303E2E0

**PUBLICATIONS**  
**DAVID H. PERSING, M.D., PH.D.**

**Books:**

Persing, D.H., T.F. Smith, T.J. White, and F. Tenover (eds). (1993) *Diagnostic Molecular Microbiology: Principles and Applications*, ASM Press, Washington, DC

Persing, D.H. (1996) *PCR Protocols for Emerging Infectious Diseases*, ASM Press, Washington, DC

**Book Chapters & Reviews:**

Persing, D.H., H.E. Varmus, and D. Ganem. (1985) Antibodies to preS and X determinants arise during natural infection with ground squirrel hepatitis virus. In *The Molecular Biology of Hepatitis Viruses*, Cold Spring Harbor Press.

Persing, D.H., H.E. Varmus, and D. Ganem. (1986) Inhibition of secretion of hepatitis B surface antigen by a related presurface polypeptide. In *The Molecular Biology of Hepatitis Viruses*, Cold Spring Harbor Press.

White, T.J., R. Madej, and D.H. Persing. (1992) The polymerase chain reaction: clinical applications. In *Advances in Clinical Chemistry*, Academic Press, San Diego, CA, pp. 161-196.

Persing, D.H. (1992) Nucleic acid amplification techniques in the diagnosis of infectious diseases. In *Clinical Laboratory Medicine*, R. C. Tilton, ed., Mosby Year Book, pp. 572-581.

Campbell, S., P. Fiedler, and D.H. Persing. (1992) Nucleic acid amplification techniques in clinical diagnostics. In *Manual of Clinical Laboratory Immunology*, American Society for Microbiology, Washington, DC.

Persing, D.H., S.W. Barthold, and S.E. Malawista. (1992) Molecular detection of *Borrelia burgdorferi*. In *Lyme Disease: Molecular and Immunologic Approaches*, Cold Spring Harbor Laboratory Press, pp. 299-315.

Barthold, S.W., M. de Souza, E. Fikrig, and D.H. Persing. (1992) Lyme borreliosis in the laboratory mouse. In *Lyme Disease: Molecular and Immunologic Approaches*, Cold Spring Harbor Laboratory Press, pp. 223-242.

Podzorski, R.P., and D.H. Persing. (1995) Molecular detection and identification of microorganisms. In *Manual of Clinical Microbiology*, 6th edition, Murray PR, Baron EJ, Pfaller MA, Tenover FC, Tenover RH (eds.), pp. 130-157, ASM Press, Washington, DC.

Relman, D.A., and D.H. Persing. (1996) Genotypic methods for microbial identification. In *PCR Protocols for Emerging Infectious Diseases*, ASM Press, Washington, DC, pp. 3-31.

Persing, D.H., D.A. Relman, and F.C. Tenover. (1996) Genotypic detection of antimicrobial resistance. In PCR Protocols for Emerging Infectious Diseases, ASM Press, Washington, DC, pp. 33-57.

Hofmeister, E.K., D.H. Persing, L. Mann, and G.L. Woods. (1996) Spirochete infections. In Clinical Diagnosis and Management by Laboratory Methods. Henry, J.B. (Ed.), 19th edition, W.B. Saunders, Philadelphia, PA.

Whelan, A.C., and Persing, D.H. (1996) The role of nucleic acid amplification and detection in the clinical laboratory. *Ann. Rev. Microbiol.* 50:349-73.

Persing, D.H. (1997) Babesiosis. In Pathology of Infectious Diseases, Volume I & II. Connor, D.H., F.W. Chandler, H.J. Manz, D.A. Schwartz, and E.E. Lack (Eds.), Appleton & Lange, Stamford, CT.

Zheng, X., and D.H. Persing. Genetic amplification techniques for the diagnosis of infectious disease. In Rapid Methods. Specter, S. (Ed.)

#### Original Articles:

Persing, D.H., L. McGinty, C.W. Adams, and R.G. Fowler. (1981) Mutational specificity of the base analogue, 2-aminopurine, in *E. coli*. *Mutation Research* 83:25-37.

Caras, I.W., M.A. MacInnes, D.H. Persing, P. Coffino, and D.W. Martin. (1982) Mechanism of 2-aminopurine mutagenesis in mouse T-lymphosarcoma cells. *Mol. Cell. Biol.* 2:1096-1103.

Persing, D.H., H.E. Varmus, and D. Ganem. (1985) A frameshift mutation in the pre-S region of the human hepatitis B virus genome allows production of surface antigen particles but eliminates binding to polymerized albumin. *Proc. Natl. Acad. Sci. USA* 82:3440-3444.

Persing, D.H., H.E. Varmus, and D. Ganem. (1986) Antibodies to preS and X determinants arise during natural infection with ground squirrel hepatitis virus. *J. Virol.* 60: 177-184.

Persing, D.H., H.E. Varmus, and D. Ganem. (1986) Inhibition of secretion of hepatitis B surface antigen by a related presurface polypeptide. *Science* 234:1388-1391.

Persing, D.H., H.E. Varmus, and D. Ganem. (1987) The preS1 protein of hepatitis B virus is acylated at its N-terminus with myristic acid. *J. Virol.* 61:1672-1677.

Persing, D.H., and M.L. Landry. (1989) In vitro Amplification Techniques for the detection of Nucleic acids: New Tools for the Diagnostic Laboratory. *Yale J. Biol. Med.* 62:159-171.

Persing, D.H., S.R. Telford, A. Spielman, and S.W. Barthold. (1989) Detection of *Borrelia burgdorferi* infection in *Ixodes dammini* ticks using the polymerase chain reaction. *J. Clin. Micro.* 28:566-572.

Persing, D.H., S.R. Telford III, P.N. Rys, D.E. Dodge, T.J. White, S.E. Malawista, and A. Spielman. (1990) Detection of *Borrelia burgdorferi* DNA in museum specimens of *Ixodes dammini* ticks. *Science* 249:1420-1423.

Persing, D.H., S.R. Telford III, A. Spielman, and S.W. Barthold. (1990) Detection of *Borrelia burgdorferi* infection in *Ixodes dammini* ticks with the polymerase chain reaction. *J. Clin. Microbiol.* 28:566-572.

Barthold, S.W., D.H. Persing, A. Armstrong, and R.A. Peeples. (1991) Kinetics of *Borrelia burgdorferi* dissemination following intradermal inoculation of mice. *Am. J. Path.* 139:263-273.

Persing, D. H. (1991) Polymerase chain reaction: Trenches to benches. *J. Clin. Micro.* 29:1281-1285.

Malawista, S.E., R.T. Schoen, T.L. Moore, D.E. Dodge, T.J. White, and D.H. Persing. (1992) Failure of multitarget detection of *B. burgdorferi*-associated DNA sequences in synovial fluids of patients with juvenile rheumatoid arthritis: a cautionary note. *Arthr. & Rheum.* 35:246-247.

Persing, D.H., D. Mathiesen, W.F. Marshall, S.R. Telford III, A. Spielman, J.W. Thomford, and P.A. Conrad. (1992) Detection of *Babesia microti* by polymerase chain reaction. *J. Clin. Microbiol.* 30:2097-2103.

Armstrong, A.L., S.W. Barthold, D.H. Persing, and D.S. Beck. (1992) Carditis in Lyme disease susceptible and resistant strains of laboratory mice infected with *Borrelia burgdorferi*. *Am. J. Trop. Med. Hyg.* 47(2):249-258.

Conrad, P.A., J. Thomford, A. Marsh, S.R. Telford III, J. Anderson, A. Spielman, E. A. Sabin, I. Yamane, and D.H. Persing. (1992) Ribosomal DNA probe for differentiation of *Babesia microti* and *B. gibsoni* isolates. *J. Clin. Microbiol.* 30:1210-1215.

Gustaferro, C.A., and D.H. Persing. (1992) Chemi-luminescent universal probe for bacterial ribotyping. *J. Clin. Microbiol.* 30:1039-1041.

Fikrig, E., S.W. Barthold, D.H. Persing, X. Sen, F.S. Kantor, and R.A. Flavell. (1992) *Borrelia burgdorferi* strain 25015: characterization of *OspA* and vaccination against infection. *J. Immunol.* 148:2256-2260.

Persing, D.H., and J. Rakela. (1992) Polymerase chain reaction for detection of hepatitis viruses: Panacea or purgatory? *Gastroenterology* 103:1098-1099.

Shapiro, E.D., M.A. Gerber, N.B. Holabird, A.T. Berg, H.M. Feder, Jr., G.L. Bell, P.N. Rys, and D.H. Persing. (1992) A controlled trial of antimicrobial prophylaxis for Lyme disease after deer-tick bites. *N. Engl. J. Med.* 327:1769-1773.

Persing, D.H. (1992) Diagnostic molecular microbiology: current challenges and future directions. *Diagn. Microbiol. Infect. Dis.* 16:159-163.

Meier, A., D.H. Persing, M. Finken, and E.C. Böttger. (1993) Elimination of contaminating DNA within PCR reagents-implications for a general approach to detect uncultured pathogens. *J. Clin. Microbiol.* 31:646-652.

Rys, P.N., and D.H. Persing. (1993) Preventing false positives: quantitative evaluation of three protocols for inactivation of polymerase chain reaction amplification products. *J. Clin. Microbiol.* 31:2356-2360.

Espy, M.J., T.F. Smith, and D.H. Persing. (1993) Dependence of polymerase chain reaction product inactivation protocols on amplicon length and sequence composition. *J. Clin. Microbiol.* 31:2361-2365.

Podzorski, R.P., and D.H. Persing. (1993) PCR: The next decade. Clin. Microbiol. Newslett. 15:137-144.

Quick, R.E., B.L. Herwaldt, J.W. Thomford, M.E. Garnett, M.L. Eberhard, M. Wilson, D.H. Spach, J.W. Dickerson, S.R. Telford III, K.R. Steingart, R. Pollock, D.H. Persing, J.M. Kobayashi, D.D. Juranek, and P.A. Conrad. (1993) Babesiosis in Washington State: a new species of Babesia. Ann. Intern. Med. 119:284-290.

Barthold, S.W., M.S. de Souza, J.L. Janotka, A.L. Smith, and D.H. Persing. (1993) Chronic Lyme borreliosis in the laboratory mouse. Am. J. Pathol. 143:959-972.

Laskus, T., J. Rakela, J.W. Mosley, M. Nowicki, and D.H. Persing. (1993) Prevalence and nucleotide sequence analysis of pre-core mutations among patients with fulminant hepatitis in the USA. Gastroenterology 105:1173-1178.

Nocton, J.J., F. Dressler, B.J. Rutledge, P.N. Rys, D.H. Persing, and A.C. Steere. (1994) Detection of Borrelia burgdorferi DNA by polymerase chain reaction in synovial fluid in Lyme arthritis. N. Engl. J. Med. 330:229-234.

Persing, D.H., B.J. Rutledge, P.N. Rys, D.S. Podzorski, K.D. Reed, P.D. Mitchell, B. Lin, and S.E. Malawista. (1994) Target imbalance: disparity of Borrelia burgdorferi genetic material in synovial fluid from Lyme arthritis patients. J. Infect. Dis. 169:664-668.

Yang, L., J.H. Weis, E. Eichwald, C.P. Kolbert, D.H. Persing, and J.J. Weis. (1994) Heritable susceptibility to Borrelia burgdorferi induced arthritis is dominant and is associated with persistence of high numbers of spirochetes in tissues. Infect. Immun. 62:492-500.

Thomford, J.W., P.A. Conrad, S.R. Telford, D. Mathiesen, B.H. Bowman, A. Spielman, M.J. Eberhard, B.L. Herwaldt, R.E. Quick, and D.H. Persing. (1994) Cultivation and phylogenetic characterization of a newly recognized human pathogenic protozoan. J. Infect. Dis. 169:1050-1056.

Laskus, T., J. Rakela, and D.H. Persing. (1994) The stem-loop structure of the cis-encapsidation signal is highly conserved in naturally occurring hepatitis B virus variants. Virology 200:809-812.

Laskus, T., J. Rakela, M.J. Tong, M. Nowicki, J.W. Mosley, and D.H. Persing. (1994) Naturally occurring hepatitis B virus mutants with deletions in the core promoter region. J. Hepatol. 20:837-841.

Persing, D.H., D. Mathiesen, D. Podzorski, and S.W. Barthold. (1994) Genetic stability of Borrelia burgdorferi recovered from chronically infected laboratory mice. Infect. Immun. 62:3521-3527.

Dicaudo, D.J., W.P.D. Su, W.F. Marshall, S.E. Malawista, S.W. Barthold, and D.H. Persing. (1994) Acrodermatitis chronica atrophicans in the United States: clinical and histopathologic features of six cases. Cutis 54:81-84.

Geha, D.J., J.R. Uhl, C.A. Gustaferrero, and D.H. Persing. (1994) Multiplex PCR for identification of methicillin-resistant staphylococci in the clinical laboratory. J. Clin. Microbiol. 32:1768-1772.

Marshall, W.F. III, S.R. Telford III, P.N. Rys, B.J. Rutledge, D. Mathiesen, A. Spielman, and D.H. Persing. (1994) Detection of Borrelia burgdorferi DNA in museum specimens of Peromyscus leucopus. J. Infect. Dis. 170:1027-1032.



Malawista, S.E., S.W. Barthold, and D.H. Persing. (1994) Fate of *Borrelia burgdorferi* DNA in tissues of infected mice after antibiotic treatment. *J. Infect. Dis.* 170:1312-1316.

Laskus, T., J. Rakela, J.L. Steers, R.H. Wiesner, and D.H. Persing. (1994) Precore and contiguous regions of hepatitis B virus in liver transplantation for end-stage hepatitis B. *Gastroenterology* 107:1774-1780.

Hunt, J.M., G.D. Roberts, L. Stockman, T.A. Felmlee, and D.H. Persing. (1994) Detection of a genetic locus encoding resistance to rifampin in mycobacterial cultures and in clinical specimens. *Diagn. Microbiol. Infect. Dis.* 18:219-227.

Laskus, T., J. Rakela, M.J. Tong, and D. H. Persing. (1994) Nucleotide sequence analysis of the precore region in patients with spontaneous reactivation of chronic hepatitis B. *Dig. Dis. Sci.* 39:2000-2006.

Laskus, T., J. Rakela, R.H. Wiesner, J.L. Steers, and D.H. Persing. (1994) Lack of evidence for hepatitis B virus (HBV) infection in fulminant non-A, non-B hepatitis. *Dig. Dis. Sci.* 39:1677-1682.

Tenover, F.C., M.B. Huang, J.K. Rasheed, and D.H. Persing. (1994) Development of PCR assays to detect ampicillin resistance genes in cerebrospinal fluid samples containing *Haemophilus influenzae*. *J. Clin. Microbiol.* 32:2729-2937.

Laskus, T., J. Rakela, J.L. Steers, R.H. Wiesner, and D.H. Persing. (1994) Precore and contiguous regions of hepatitis B virus in liver transplantation for end-stage hepatitis B. *Gastroenterology* 107:1774-1780.

Reed, K.D., P.D. Mitchell, D.H. Persing, and C.P. Kolbert. (1995) Transmission of human granulocytic ehrlichiosis [letter]. *J. Amer. Med. Assoc.* 273:23.

Persing, D.H., B.L. Herwaldt, C. Glaser, R.S. Lane, J.W. Thomford, D. Mathiesen, P.J. Krause, D.F. Phillip, and P.A. Conrad. (1995) Infection with a *Babesia*-like organism in northern California. *N. Engl. J. Med.* 332:298-303.

Whelen, A.C., T.A. Felmlee, J.M. Hunt, D.L. Williams, G.D. Roberts, L. Stockman, and D.H. Persing. (1995) Direct genotypic detection of *Mycobacterium tuberculosis* rifampin resistance in clinical specimens by using single-tube hemi-nested PCR. *J. Clin. Microbiol.* 33:556-561.

Moore, S.B., J.R. Kruger, J. Rakela, E.C. Vamvakas, C. Schimek, J.J. Germer, and D.H. Persing. (1995) Blood donors who are repeatedly reactive for hepatitis C virus on enzyme immunoassay and positive on recombinant immunoblot assay: evidence of failure to identify some risk factors. *Transfusion* 35:308-312.

Weiss, J.B. Jr., and D.H. Persing. (1995) Hepatitis C: advances in diagnosis. *Mayo Clin. Proc.* 70:296-297.

Laskus, T., J. Rakela, and D.H. Persing. (1995) Nucleotide sequence analysis of precore and proximal core regions in patients with chronic hepatitis B treated with interferon. *Dig. Dis. Sci.* 40:1-7.

Zein, N.N., J. Rakela, and D.H. Persing. (1995) Genotype-dependent serologic reactivities in patients infected with hepatitis C virus in the United States. *Mayo Clin. Proc.* 70:449-452.

Gross, J.B. Jr., and D.H. Persing. (1995) Hepatitis C: advances in diagnosis and therapy. *Mayo Clin. Proc.* 70:296-297.



Barthold, S.W., E. Fikrig, L.K. Bockenstedt, and D.H. Persing. (1995) Circumvention of outer surface protein A immunity by host-adapted *Borrelia burgdorferi*. *Infect. & Immun.* 63:2255-2261.

Felmlee, T.A., D.H. Persing, and J.P. Landers. (1995) Capillary electrophoresis of DNA: application to clinical diagnoses. *J. Chromatog.* 717:127-137.

Zein, N.N., J. Rakela, J.J. Poterucha, and D.H. Persing. (1995) Hepatitis C genotypes in liver transplant patients: distribution and 1-year follow-up. *Liver Transplant. Surg.* 1:354-357.

Anguita J., D.H. Persing, M. Rincón, S.W. Barthold, and E. Fikrig. (1996) Effect of anti-interleukin 12 treatment on murine Lyme borreliosis. *J. Clin. Invest.* 97:1028-1034.

Cockerill, F.R., D.E. Williams, K.D. Eisenach, B.C. Kline, L.K. Miller, L. Stockman, J. Voyles, G.M. Caron, S.K. Bundy, G.D. Roberts, W.R. Wilson, A.C. Whelen, J.M. Hunt, and D.H. Persing. (1996) Prospective evaluation of the utility of molecular techniques for diagnosing nosocomial transmission of multidrug-resistant tuberculosis. *Mayo Clin. Proc.* 71:221-229.

Telenti, A., and D.H. Persing. (1996) Novel strategies for the detection of drug resistance in *Mycobacterium tuberculosis*. *Res. Microbiol.* 147:73-79.

Herwaldt, B.L., D.H. Persing, E.A. Pr  cigout, W.L. Goff, D.A. Mathiesen, P.W. Taylor, M.L. Eberhard, and A.F. Gorenflot. (1996) A fatal case of babesiosis in Missouri: identification of another piroplasm that infects humans. *Ann. Intern. Med.* 124:643-650.

Walker, D.H., A. Barbour, J.H. Oliver, R.S. Lane, J.S. Dumler, D.T. Dennis, D.H. Persing, A.F. Azad, and E.S. McSwegan. (1996) Emerging bacterial zoonotic and vector-borne diseases: ecological and epidemiological factors. *J. Amer. Med. Assoc.* 275:463-469.

Anderson, J.F., R.A. Flavell, L.A. Magnarelli, S.W. Barthold, F.S. Kantor, R. Wallich, D.H. Persing, D. Mathiesen, and E. Fikrig. (1996) Novel *Borrelia burgdorferi* isolates from *Ixodes scapularis* and *Ixodes dentatus* ticks feeding on humans. *J. Clin. Microbiol.* 34:524-529.

Persing, D.H., and P.A. Conrad. (1996) Babesiosis: new insights from phylogenetic analysis. *Infect. Agents & Dis.* 4:182-195.

Telford, S.R. III, J.E. Dawson, P. Katavolos, C.K. Warner, C.P. Kolbert, and D.H. Persing. (1996) Perpetuation of the agent of human granulocytic ehrlichiosis in a deer tick-rodent cycle. *Proc. Natl. Acad. Sci.* 93:6209-6214.

Krause, P.J., S. Telford III, A. Spielman, V. Sikand, R. Ryan, D. Christianson, G. Burke, P. Brassard, R. Pollack, J. Peck, and D.H. Persing. (1996) Concurrent Lyme disease and babesiosis: evidence for increased severity and duration of illness. *JAMA* 275:1657-1660.

Gewirtz, A.S., P.J. Cornbleet, D.J. Vugia, C. Traver, J. Niederhuber, C.P. Kolbert, and D.H. Persing. (1996) Human granulocytic ehrlichiosis: report of a case in northern California. *Clin. Infect. Dis.* 23:653-654.  
Original Articles, continued:

Zein, N.N., and D.H. Persing. (1996) Hepatitis C genotypes: current trends and future implications. *Mayo Clin. Proc.* 71:458-462.

- Tenover, F.C., B. Swaminathan, R.D. Arbeit, R.V. Goering, P.A. Mickelsen, B.E. Murray, and D.H. Persing. (1996) Diversity among *Helicobacter pylori* isolates. *J. Clin. Microbiol.* 34:1041.
- MacDonald, K.L., M.T. Osterholm, K.H. LeDell, K.E. White, C.H. Schenck, C.C. Chao, D.H. Persing, R.C. Johnson, J.M. Barker, and P.K. Peterson. (1996) A case-control study to assess the role of silicone-gel breast implants and other factors in chronic fatigue syndrome. *Am. J. Med.* 100:548-554.
- Zein, N.N., J. Rakela, E.L. Krawitt, K.S. Reddy, T. Tominaga, and D.H. Persing. (1996) Hepatitis C genotypes: epidemiology, pathogenicity, and response to interferon therapy. *Ann. Intern. Med.* 125:634-639.
- Nocton, J.J., B.J. Bloom, B.J. Rutledge, and D.H. Persing. (1996) Detection of *Borrelia burgdorferi* DNA by polymerase chain reaction in cerebrospinal fluid in Lyme neuroborreliosis. *J. Infect. Dis.* 174:623-627.
- Mathiesen, D., J.H. Oliver Jr., C.P. Kolbert, E. Tullson, B. Johnson, R. Campbell, P. Mitchell, K. Reed, S. Telford III, J. Anderson, R. Lane, and D.H. Persing. (1997) Genetic heterogeneity of *Borrelia burgdorferi* in the United States. *J. Infect. Dis.* 175:98-107.
- Pancholi, P., R.P. Oda, P.S. Mitchell, J.P. Landers, and D.H. Persing. (1997) Clinical diagnostic detection of hepatitis C and herpes simplex viral PCR amplification products by capillary electrophoresis with laser-induced fluorescence. *Mol. Diag.* 2:27-38.
- Persing D.H. Nucleic acid-based pathogen discovery techniques: application to zoonoses. *Mol. Diag.*, in press.
- Ramzan, N.N., E. Loftus Jr., L. Burgart, M. Rooney, K. Batts, R.H. Wiesner, D.N. Fredricks, D.A. Relman, and D.H. Persing. Molecular diagnosis and monitoring of Whipple's disease. *Ann. Intern. Med.*, in press.
- Zhang, Y.-Q., D. Mathiesen, C.P. Kolbert, J. Anderson, R.T. Schoen, E. Fikrig, and D.H. Persing. B. burgdorferi ELISA for discrimination of OspA vaccination from spirochete infection. *J. Clin. Microbiol.*, in press.
- Krause, P.J., R. Ryan, S. Telford III, D.H. Persing, and A. Spielman. Efficacy of an IgM serodiagnostic test for the rapid diagnosis of acute babesiosis. In press.
- Krause, P.J., S. Telford III, A. Spielman, R. Ryan, M. Cartter, J. Magera, T.V. Rajan, D. Christianson, T. Maruccha, L. Woody, and D.H. Persing. Comparison of PCR with blood smear and small animal inoculation for diagnosis of *Babesia microti* parasitemia. In press.
- Kolbert, C.P., E.S. Bruinsma, A.S. Abdulkarim, E. Hofmeister, J. Adams-Stich, S.R. Telford III, and D.H. Persing. Direct recovery and characterization of an immunoreactive protein from the agent of human granulocytic ehrlichiosis. *J. Clin. Microbiol.*, in press.
- Zein, N.N., J.J. Poterucha, J.B. Gross, Jr., R.H. Wiesner, and D.H. Persing. Increased risk of hepatocellular carcinoma in patients infected with hepatitis C genotype 1b. *Gastroenterology*, submitted.
- Zein, N.N., P.S. Mitchell, and D.H. Persing. Indeterminate second-generation radioimmunoassay and the significance of highly reactive C22-3 band. *J. Clin. Microbiol.*, submitted.
- Persing, D.H. The cold zone: a curious convergence of tick-transmitted diseases. *Clin. Infect. Dis.*, in press.

Whelen, A.C., and D.H. Persing. The role of nucleic acid amplification and detection in the clinical microbiology laboratory. *Microbiol. Rev.*, submitted.

Alonso, J., D.H. Persing, P. Anda, L.E. Gibson, B.J. Rutledge, and L. Iglesias. No evidence for *Borrelia burgdorferi* infection in lesions of morphea and lichen sclerosus et atrophicus in Spain: a prospective study and a review of the literature. Submitted.

Gordon, F.D., J.J. Poterucha, J. Germer, N.N. Zein, K.P. Batts, J.B. Gross Jr., R.H. Wiesner, and D.H. Persing. The relationship between hepatitis C genotype and the severity of recurrent hepatitis C after liver transplantation. Submitted.

Zein, N.N., A.J. Czaja, D.H. Persing, P.J. Santrach, S.B. Moore. Viral and genetic factors as determinants of autoimmune expression in chronic hepatitis C. Submitted.

Belongia, E.A., K.D. Reed, P.D. Mitchell, C.P. Kolbert, D.H. Persing, J.S. Gill, J.J. Kazmierczak. Prevalence of granulocytic *Ehrlichia* infection among white-tailed deer in Wisconsin. In press.

Duffy, J., C.P. Kolbert, B. Rutledge, and D.H. Persing. Active coinfection with *B. burgdorferi* and the agent of granulocytic ehrlichiosis. *The Lancet*, in press.

Krause, P.J., S. Telford III, A. Spielman, V.J. Sikand, D. Christianson, P. Brassard, J. Magera, T. Maruccha, M. Cartter, G. Burke, T.V. Rajan, and D.H. Persing. Molecular monitoring of *Babesia microti* parasitemia: evidence of chronic infections in humans. In preparation.

Hofmeister, E.K., J.E. Childs, and D.H. Persing. Clonal selection for population members may contribute to the maintenance of *Borrelia burgdorferi* in naturally infected *Peromyscus leucopus*. In preparation.

Gordon, F.D., N.N. Zein, J.J. Poterucha, R.H. Wiesner, J.B. Gross, and D.H. Persing. Increased risk of histologic recurrence following liver transplantation in patients infected with HCV genotype 1b. Submitted.

Kang, I., S.W. Barthold, D.H. Persing, and L.K. Bockenstedt. T helper cell cytokines in early murine Lyme borreliosis: evidence for coordination of Th1 and Th2 responses in disease resistance. Submitted.

Daoud, M.S., J.B. Gross Jr., R.D. Ellefson, D.H. Persing, and W.P.D. Su. Prevalence of chronic hepatitis C infection in patients with porphyria cutanea tarda in the United States. Submitted.

Guerrero, R.B., K.P. Batts, D.J. Brandhagen, J.J. Germer, R.G. Perez, and D.H. Persing. Effects of formalin fixation and prolonged block storage on detection of hepatitis C virus RNA in liver tissue. *Diagn. Mol. Pathol.*, Submitted.

Guerrero, R.B., K.P. Batts, J.J. Germer, and D.H. Persing. Reverse transcriptase-polymerase chain reaction fails to detect peripheral blood hepatitis C RNA in formalin-fixed liver tissue. *Diagn. Mol. Pathol.*, Submitted.

Hofmeister, E.K., C.P. Kolbert, A.S. Abdulkarim, J.M. Magera, M.K. Hopkins, J.R. Uhl, A. Ambyaye, S.R. Telford III, F.R. Cockerill III, and D.H. Persing. Cosegregation of a novel *Bartonella* sp. with *Borrelia burgdorferi* and *Babesia microti* in *Peromyscus leucopus*. Submitted.

Czaja, A.J., A.S. Abdulkarim, H.A. Carpenter, R.G. Perez, D.H. Persing, and N.N. Zein. Hepatitis G virus infection in type 1 autoimmune hepatitis. Submitted.

Jahangir, A., C. Kolbert, W. Edwards, P. Mitchell, J.F. Hall, J.S. Dumler, and D.H. Persing. Fatal pancarditis associated with granulocytic ehrlichiosis in a 44-year-old man. N. Engl. J. Med., submitted.

#### Abstracts:

Persing, D.H., L. McGinty, and R.G. Fowler. (1980) Mutational specificity of the base analogue, 2-amino-purine, in *Escherichia coli* (Abstract) Genetics, 94, s82.

Persing, D.H., H.E. Varmus, and D. Ganem. (1986) A mutation in the pre-S region of HBV abolishes albumin binding activity of hepatitis B surface antigen polypeptides in Viral Hepatitis, UC San Francisco symposium on viral hepatitis and liver disease.

Persing, D.H., and Edberg, S.C. (1989) Identification and characterization of *Chlamydia trachomatis* in clinical specimens using the polymerase chain reaction. Annual Meeting, the American Society for Microbiology, New Orleans, LA.

Schillinger, J., P. Rys, and D.H. Persing. (1990) Detection and characterization of HPV infection: comparison of dot-blotting and PCR. Annual Meeting, the American Society for Microbiology, Anaheim, CA.

Shapiro, E., M. Gerber, D. Persing, S. Luger, and H. Feder. (1990) Risk of developing Lyme disease after a deer tick bite in an endemic area. Abstracts, International Conference on Antimicrobial Agents and Chemotherapy, New Orleans, LA.

Marshall, W.F, D.J. Dicaudo, P.N. Rys, W.P.D. Su, and D. H. Persing. (1991) The antiquity of Lyme disease: demonstration of *Borrelia burgdorferi* DNA in archived human tissues. 31st Interscience Conference on Antimicrobial Agents and Chemotherapy, Chicago, IL.

Mathiesen, D., S.R. Telford, III, A. Spielman, W.F. Marshall, P.A. Conrad and D.H. Persing. (1991) Detection of *Babesia microti* in parasitemic human blood using the polymerase chain reaction. 5th San Diego Conference on Nucleic Acids, San Diego, CA.

Gustaferro, C., and D.H. Persing. (1991) A chemiluminescent universal probe for bacterial ribotyping. 5th San Diego Conference on Nucleic Acids, San Diego, CA.

Rys, P.N., and D.H. Persing. (1991) Evaluation of photochemical and enzymatic methods for amplicon sterilization. 5th San Diego Conference on Nucleic Acids, San Diego, CA.

Podzorski, D.S., D. Mathiesen, J. Proper, and D.H. Persing. (1991) DNA sequence divergence within the *OspA* genes of two North American isolates of the Lyme disease spirochete, *Borrelia burgdorferi*. 5th San Diego Conference on Nucleic Acids, San Diego, CA.

Hopkins, M.K., P.K.W. Yu, D.H. Persing, and J.P. Anhalt. (1991) Simplified scheme for screening of *Escherichia coli* O157:H7 from Stool Cultures. 91st General Meeting of the American Society for Microbiology, Dallas, Texas.

Gutschenritter, J., P. Schams, C. O'Hara, and D.H. Persing. (1992) Comparison of the Biolog and MIDI systems for identification of Gram-negative nonfermenters. 92nd General Meeting of the American Society for Microbiology, Dallas, Texas.

Piper, K., M.E. Brecher, L. Bland, and D.H. Persing. (1992) Use of a chemiluminescent universal bacterial probe for pre-transfusion screening of blood products. 92nd General Meeting of the American Society for Microbiology, Dallas, Texas.

Uhl, J.R., L. Stockman, N.K. Henry, C.A. Gustafarro, J.E. Rosenblatt, B.C. Kline, and D.H. Persing. (1992) Comparison of pulsed-field gel electrophoresis chemi-luminescent ribotyping and fatty acid analysis for typing *Xanthomonas maltophilia*. 92nd General Meeting of the American Society for Microbiology, Dallas, Texas.

Thomford, J.W., P.A. Conrad, S.R. Telford III, R. Quick, B. Herwaldt, M. Eberhard, D. Mathieson, and D. Persing. (1992) A new human *Babesia* in the Western United States. International Conference of Diseases in Nature Communicable to Man, Vancouver, British Columbia.

Douglas, D.D., J. Rakela, H.F. Taswell, D.H. Persing, J. Wilber, R. Sanchez-Pescador, P. Neuwald, and M.S. Urdea. (1992) Correlation of quantitative HCV RNA, anti-HCV IgM, and Serum ALT with histologic presentation. American Association for the Study of Liver Diseases, Chicago, Illinois.

Weinstein, J.S., J. Rakela, D.D. Douglas, D.H. Persing, F.B. Hollinger, H.J. Lin, J.C. Wilber, C.S. Chan, P. Neuwald, and M.S. Urdea. (1992) Comparison of a quantitative HCV-RNA assay to PCR in monitoring the effect of alpha-interferon in patients with chronic hepatitis C. American Association for the Study of Liver Diseases, Chicago, Illinois.

Persing, D.H., W.F. Marshall, S.R. Telford, P.N. Rys, and A. Spielman. (1992) Detection of *Borrelia burgdorferi* DNA in museum specimens of *Peromyscus leucopus*. International Conference on Lyme Borreliosis. Arlington, VA.

Krause, P.J., N. Olson, D. Hild, S. Telford, J. Magera, and D.H. Persing. (1993) Identification of *Babesia microti* in the bone marrow of a renal transplant patient. Infectious Diseases Society of America, Washington, DC.

Tenover, F.C., M.B. Huang, J.K. Rasheed, and D.H. Persing. (1993) Direct detection of ampicillin-resistant *Haemophilus influenzae* (HI) in cerebrospinal fluid (CSF) by using polymerase chain reaction (PCR). 33rd ICAAC, New Orleans, Louisiana.

Geha, D., and D.H. Persing. (1993) Enzymatic detection of polymerase chain reaction products (ED-PCR) compared to multiplex PCR (MP-PCR) for detection of *MecA* in *Staphylococci*. 33rd ICAAC, New Orleans, Louisiana.

Thomford, J.A., P. Conrad, C. Glaser, B. Lane, S. Telford III, D. Mathiesen, B. Bowman, A. Spielman, M. Eberhard, B. Herwaldt, R. Quick, and D.H. Persing. (1993) A newly identified human pathogen is related to the oncogenic parasite *Theileria*. 33rd ICAAC, New Orleans, Louisiana.

Krause, P., V.J. Sikand, L. Bow, D. Christianson, M. Cartter, J. Magera, and D.H. Persing. (1993) PCR diagnosis of *Babesia microti* infection in humans. 33rd ICAAC, New Orleans, Louisiana.

Espy, M.J., T.F. Smith, and D.H. Persing. (1993) Effect of amplicon size and nucleotide composition on inactivation by isopsoralen (IP) and uracil-N-glycosylase (UNG) after amplification by polymerase chain reaction (PCR). 93rd ASM General Meeting, Atlanta, Georgia.

Rys, P., and D.H. Persing. (1993) Avoiding false positives with PCR: comparison of three methods for inactivation of amplified DNA. 93rd ASM General Meeting, Atlanta, Georgia.

Hunt, D.J., A. Telenti, G. D. Roberts, L. Stockman, T.A. Felmlee, and D.H. Persing. (1993) Detection of a genetic locus encoding resistance to rifampin in mycobacterial cultures and in clinical specimens. 93rd ASM General Meeting, Atlanta, Georgia.

Geha, D., J. Uhl, and D.H. Persing. (1993) Multiplex PCR for identification of methicillin-resistant *Staphylococci* in the clinical laboratory. 93rd ASM General Meeting, Atlanta, Georgia.

Abstracts, continued:

Persing, D.H., and D. Podzorski. (1993) Genetic transformation of the Lyme disease spirochete. 93rd ASM General Meeting, Atlanta, Georgia.

Kolbert, C., D. Podzorski, D. Mathiesen, and D.H. Persing. (1993) Molecular analysis of strain variation among *Borrelia burgdorferi* isolates from the United States. 93rd ASM General Meeting, Atlanta, Georgia.

Zein, N.N., J. Rakela, J. Poterucha, R.H. Wiesner, R.A. F. Krom, and D.H. Persing. (1993) HCV genotypes in liver transplant patients. American Gastroenterological Association, New Orleans, Louisiana.

Zein, N. N., J. Rakela, E.L. Krawitt, R. Reddy, V. Idrovo, L. Jeffers, E. Schiff, A.A. Gossard, J.B. Gross, J. Poterucha, and D.H. Persing. (1993) Distribution of HCV genotypes in patients with chronic hepatitis C infection in USA. American Gastroenterological Association, New Orleans, Louisiana.

Laskus, T., J. Rakela, J.W. Mosley, M. Nowicki, and D.H. Persing. (1993) Prevalence and nucleotide sequence analysis of pre-core mutations among patients with fulminant hepatitis in the USA. International Symposium on Viral Hepatitis and Liver Disease, Tokyo, Japan.

Laskus, T., D.H. Persing, J.S. Weinstein, S. Kuwada, R.H. Wiesner, J.L. Steers, and J. Rakela. (1993) Absence of HBV DNA in patients with fulminant NANB hepatitis. AASLD, Chicago, Illinois.

Laskus, T., J. Rakela, J.S. Weinstein, M.J. Tong, and D.H. Persing. (1993) Nucleotide sequence analysis of the precore region in patients with spontaneous reactivation of chronic hepatitis. AASLD, Chicago, Illinois.

Laskus, T., J. Rakela, J.S. Weinstein, M.J. Tong, M. Nowicki, J.W. Mosley, and D.H. Persing. (1993) Core promoter deletions naturally occurring hepatitis B virus (HBV) variants. AASLD, Chicago, Illinois.

Laskus, T., J. Rakela, and D.H. Persing. (1993) The stem-loop structure of the cis-encapsidation signal is highly conserved in naturally occurring hepatitis B virus (HBV) variants. American Gastroenterological Association and AASLD, New Orleans, Louisiana.



Laskus, T., J. Rakela, J.L. Steers, R.H. Wiesner, and D.H. Persing. (1993) Molecular characterization of the precore, core promoter, and proximal core regions of hepatitis B virus (HBV) in patients undergoing orthotopic liver transplantation. American Gastroenterological Association, New Orleans, Louisiana.

Oliver, J., T. Kollars, F. Chandler, E. Masters, R. Lane, D.H. Persing, and P. Duray. (1994) Unusual tick isolates of *Borrelia burgdorferi* from Southeast Missouri associated geographically and temporally with human Lyme disease. VI International Conference on Lyme Borreliosis, Bologna, Italy.

Whelen, A.C., J. Hunt, T. Felmlee, D. Williams, G. Roberts, L. Stockman, and D.H. Persing. (1994) Rapid and specific PCR-based detection of drug-resistant and sensitive *Mycobacterium tuberculosis* American Society for Microbiology, Las Vegas, Nevada.

Schutzer, S.E., and D.H. Persing. (1994) Surrogate markers of active infection in vaccine trials. CSH Vaccine Meeting, Banbury Conference on Vaccine Development, Cold Spring Harbor, New York.

Abstracts, continued:

Zein, N.N., C.G.A. McGregor, K. Schwab, N.K. Wendt, P.S. Mitchell, D.H. Persing, and J. Rakela. (1994) Prevalence of hepatitis C infection among heart transplant recipients. American Association for the Study of Liver Diseases, Chicago, Illinois.

Zein, N.N., J. Rakela, E.L. Krawitt, J. Poterucha, J.B. Gross, Jr., A.A. Gossard, and D.H. Persing. (1994) Response to interferon in patients with different HCG genotypes in U.S.A. American Association for the Study of Liver Diseases, Chicago, Illinois.

Nocton, J.J., B. Bloom, B.J. Rutledge, P.N. Rys, D.H. Persing, and A.C. Steere. (1994) Detection of *Borrelia burgdorferi* DNA by polymerase chain reaction in cerebrospinal fluid in patients with neurologic involvement in Lyme disease. 58th Annual Scientific Meeting of the American College of Rheumatology, Minneapolis, Minnesota.

Zein, N.N., C.G.A. McGregor, K. Schwab, P.S. Mitchell, N.K. Wendt, D.H. Persing, and J. Rakela. (1995) Prevalence and outcome of hepatitis C infection among heart transplant recipients. International Society for Heart and Lung Transplantation, San Francisco, California.

Felmlee, T.A., D.H. Persing, and J.P. Landers. (1995) Capillary electrophoretic determination of single point mutations in DNA: potential clinical applications.

Dumler, J.S., J.S. Bakken, P.D. Mitchell, C.P. Kolbert, P. Pancholi, and D.H. Persing. (1995) Human granulocytic ehrlichiosis (HGE), Lyme disease, and babesiosis in the Upper Midwest: evidence for concurrent infections. 35th ICAAC, San Francisco, CA.

Kolbert, C.P., P. Pancholi, P. Mitchell, K. Reed, J.S. Dumler, J. Bakken, and D.H. Persing. (1995) Evidence for human granulocytic ehrlichiosis in patients with suspected Lyme disease. American Society for Microbiology, Washington, DC.

Krause, P., S. Telford III, A. Spielman, V.J. Sikand, R. Ryan, D. Christianson, P. Brassard, R. Pollack, G. Burke, and D.H. Persing. (1995) Increased severity of Lyme disease illness due to concurrent babesiosis. 35th ICAAC, San Francisco, CA.

Gross, J., N. Zein, J. Germer, J. Poterucha, A. Gossard, N. Wendt, P. Mitchell, N. Ramzan, and D.H. Persing. (1995) Changes in predominant hepatitis C genotype during alpha-interferon therapy. EASL Meeting.

Zein, N., J. Gross, A. Gossard, R. Wiesner, J. Poterucha, and D.H. Persing. (1995) Significance of hepatitis C virus (HCV) RNA levels in orthotopic liver transplant recipients (OLT). EASL Meeting.

Schimek, C.M., N.N. Zein, N.K. Wendt, P.S. Mitchell, J.J. Germer, J.N. Thorvilson, and D.H. Persing. (1995) Correlation between strong RIBA 2.0 c22-3 indeterminate results and HCV viremia in HCV EIA reactive subjects. American Association of Blood Banks, 48th Annual Meeting, New Orleans, LA.

Zein, N., J. Gross, A. Gossard, R. Wiesner, J. Poterucha, and D.H. Persing. (1995) Significance of hepatitis C virus (HCV) RNA levels in orthotopic liver transplant (OLT) recipients. Joint Congress on Liver Transplantation, London, England.

Smith, C.I., K.D. Lake, J.A. Haroldson, D.H. Persing, R.W. Emery, and M.R. Pritzker. (1995) Clinical experience with hepatitis C (HCV) infection in a cardiac transplant center. American Association for the Study of Liver Diseases, Chicago, IL.

Krause, P.J., S.R. Telford III, A. Spielman, V.J. Sikand, R. Ryan, D. Christianson, P. Brassard, R. Pollack, G. Burke, and D.H. Persing. (1995) 535 increased severity of Lyme disease illness due to concurrent babesiosis. American Society of Tropical Medicine and Hygiene.

Gupta, P., R.W. Hurley, D.H. Persing, and D.E. Hammerschmidt. (1995) Acute relapsing Babesia microti infection in an immunocompromised host: important lessons for the hematologist. American Society of Hematology, Seattle, WA.

Persing, D.H. (1995) Molecular diagnostic methods and infectious diseases: today and tomorrow. 33rd Annual IDSA Meeting, San Francisco, CA.

Oda, R.P., J.J. Germer, D.H. Persing, and J.P. Landers. (1996) Capillary electrophoresis in polymer networks with laser-induced fluorescence detection as a rapid diagnostic test for tick-transmitted diseases. 8th International Symposium on High Performance Capillary Electrophoresis, Orlando, FL.

Zein, N.N., D.H. Persing, and A.J. Czaja. (1996) Viral and genetic factors as determinants of autoimmune expression in chronic hepatitis C. American Gastroenterological Association and American Association for the Study of Liver Diseases, Chicago, IL.

Brandhagen, D.J., J.J. Poterucha, J.B. Gross Jr., W.R. Kim, R.G. Perez, J.J. Germer, A.A. Gossard, J. Detmer, J. Kolberg, M. Collins, and D.H. Persing. (1996) Hepatitis G infection in patients undergoing interferon treatment for chronic hepatitis C: clinical characteristics and HGV RNA levels. American Association for the Study of Liver Diseases, Chicago, IL.

Brandhagen, D.J., J.B. Gross Jr., K.P. Batts, F.D. Gordon, R.H. Wiesner, A.A. Gossard, D.H. Persing, and J.J. Poterucha. (1996) Recurrence of hepatitis C after transplant: significance of HLA match and HCV genotype. American Association for the Study of Liver Diseases, Chicago, IL.

Brandhagen, D.J., J.B. Gross Jr., J.J. Poterucha, W.R. Kim, M.R. Charlton, R.G. Perez, J.J. Germer, J. Detmer, J. Kolberg, M. Collins, R.H. Wiesner, and D.H. Persing. (1996) Hepatitis G infection as determined by bDNA in patients with hepatitis C undergoing liver transplantation: clinical characteristics and viral levels. American Association for the Study of Liver Diseases, Chicago, IL.

Abdulkarim, A.S., N.N. Zein, L. Kabbani, A. Hawla, N. Agha, M. Tourogman, K.L. Krajnik, J.J. Germer, C.P. Kolbert, and D.H. Persing. (1996) Hepatitis C (HCV) genotype and hepatitis G (HGV) in hemodialysis patients from Syria: the identification of two novel hepatitis C subtypes. American Association for the Study of Liver Diseases, Chicago, IL.

Zein, N.N., A.S. Abdulkarim, D. Brandhagen, T. Therneau, and D.H. Persing. (1996) Chronic hepatitis C infection (HCV) in the U.S.: an insight into the natural history and evidence for a change in the epidemiology of HCV genotypes. American Association for the Study of Liver Diseases, Chicago, IL.

Zein, N.N., A.S. Abdulkarim, R.H. Wiesner, and D.H. Persing. (1996) Increased risk for diabetes mellitus type II (DM) with chronic hepatitis C infection (HCV). American Association for the Study of Liver Diseases, Chicago, IL.

Charlton, M.R., D. Brandhagen, J.J. Poterucha, J.B. Gross Jr., J. Detmer, M. Collins, J. Kolberg, R.A.F. Krom, R.H. Wiesner, and D.H. Persing. (1996) Prevalence, titers and histology of HGV infection pre- and one year post-OLT in patients transplanted for cryptogenic cirrhosis. American Association for the Study of Liver Diseases, Chicago, IL.

Lake, K.D., C.I. Smith, J. Germer, D.H. Persing, M.R. Pritzker, and R.W. Emery. (1996) Hepatitis C (HCV) genotyping of cardiac transplant recipients. American Association for the Study of Liver Diseases, Chicago, IL.

Czaja, A.J., A.S. Abdulkarim, D.H. Persing, and N.N. Zein. (1997) Hepatitis G virus in type I autoimmune hepatitis. American Gastroenterological Association and American Association for the Study of Liver Diseases.

465057 0308230